

Message Text

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SUBJECT:US-USSR S&T AGREEMENT: NEW PROJECTS (01.0004)

REF: MOSCOW 9253 (01.)

1. PLEASE TRANSMIT FOLLOWING MORRIS LETTER TO AYKAZYAN.
2. 01.0004 - MAY 5, 1978

DR. E. A. AYKAZYAN
CHIEF, SECTION FOR USA
ADMINISTRATION FOR FOREIGN RELATIONS
STATE COMMITTEE FOR SCIENCE AND TECHNOLOGY
MOSCOW

DEAR DR. AYKAZYAN:
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IT IS GOOD OF YOU TO AGREE TO RECEIVE MR. PARDEE AND
MYSELF THE WEEK OF JUNE 5. I PROPOSE THAT WE ARRIVE IN
MOSCOW SATURDAY, JUNE 3 AND HAVE OUR DISCUSSIONS
JUNE 5-6. WE WOULD PLAN TO DEPART MOSCOW ON WEDNESDAY,
JUNE 7. COULD YOU LET ME KNOW WHETHER THIS TIMING IS
ACCEPTABLE?

ON BEHALF OF THE US SIDE I AM PLEASE TO ENCLOSE
SUMMARIES OF FIVE PROPOSALS FOR POSSIBLE NEW JOINT
ACTIVITY UNDER THE S&T AGREEMENT. WE LOOK FORWARD TO

RECEIVING THE SOVIET SUGGESTIONS WHICH, I UNDERSTAND, MAY CENTER ON EXPANSION OF PROJECTS UNDER EXISTING WORKING GROUPS RATHER THAN ESTABLISHMENT OF NEW WORKING GROUPS.

SINCERELY,

ROBERT G. MORRIS

ENCLOSURES

EARTH SCIENCES

IT SHOULD BE NOTED THAT THIS PROGRAM IS AN EXTENSION OF PROJECTS ON THE EARTH'S CRUST, AND INVOLVES FIELD AND GEOPHYSICAL STUDIES IN AREAS MUTUALLY AGREED UPON.

1. DYNAMICS AND CHEMISTRY OF UNDERGROUND WATERS.
DISPOSAL OF WASTE MATERIALS.

2. ORE FORMING PROCESSES.

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3. STRUCTURE AND EVOLUTION OF THE CONTINENTAL CRUST.

A. GEOLOGY

(1) PETROLOGY OF PRE-CAMBRIAN ROCKS, ESPECIALLY IN RESPECT TO GEOCHEMICAL PROCESSES, INCLUDING METALLOGENESIS. (THE EXPOSED PRE-CAMBRIAN AREAS OF BOTH THE U.S. AND THE U.S.S.R. ARE LIMITED, AND COMBINING THE RESULTS OF SUCH STUDIES SHOULD BE BENEFICIAL.)

(2) STUDIES OF CAMBRIAN AND YOUNGER AREAS TO DECIPHER CONTINENTAL MOVEMENTS, COLLISIONS, AND THE DEVELOPMENT OF MOUNTAIN BELTS. (SUCH STUDIES WOULD AID IN THE EXPLORATION FOR ORES AND FOSSIL FUELS.)

B. GEOPHYSICS

(1) DETERMINING DEEP CRUSTAL STRUCTURE.

(A) DEEP SEISMIC REFRACTION LINES. (THE USSR HAS OBTAINED SUCH LINES THAT SHOW CRUST UNLIKE THAT IN NORTH AMERICA.)

(B) DEEP REFLECTION PROFILES. (THE U.S. HAS SUCH A PROGRAM, WITH NO SOVIET COUNTERPART.)

(C) EXCHANGE OF DATA SHOULD BENEFIT BOTH SIDES. DATA SHOULD BE CORRELATED WITH DATA ON GRAVITY, MAGNETICS,

HEAT FLOW, AND ELECTRICAL STUDIES.

C. DEEP CONTINENTAL DRILLING

(1) SEA DRILLING

USSR PARTICIPATES IN THE U.S. DEEP SEA DRILLING PROJECT
AT SEA AND IN THE ANALYSES.

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(2) CONTINENTAL DRILLING

(A) USSR HAS A UNIQUE PROGRAM OF DEEP DRILLING ON LAND

(B) U.S. IS PROPOSING TO EXPAND ITS CONTINENTAL DRILLING
EFFORTS

(C) EXCHANGE OF INFORMATION SHOULD BE ESTABLISHED

COOPERATIVE RESEARCH IN HEAT AND MASS TRANSFER

THEORETICAL AND EXPERIMENTAL RESEARCH IN HEAT AND MASS
TRANSFER IS BEING ACTIVELY PURSUED IN BOTH THE UNITED
STATES AND THE SOVIET UNION.

THERE IS A COMMONALITY OF INTEREST AMONG THE RESEARCHERS
IN THE TWO COUNTRIES, AND A FORMAL PROGRAM OF COOPERATIVE
RESEARCH IN HEAT AND MASS TRANSFER WILL BE MUTUALLY
BENEFICIAL. A JOINT PROGRAM THAT BRINGS TOGETHER THE
BEST INTELLECTUAL CAPABILITY AND LABORATORY FACILITIES
IN THIS FIELD IN THE U.S. AND U.S.S.R. CAN HAVE A
SIGNIFICANT POSITIVE INFLUENCE ON THE TECHNOLOGICAL
DEVELOPMENT IN THE TWO COUNTRIES. TO DERIVE THE MAXIMUM
IMPACT FROM THE RESEARCH, IT OUGHT TO FOCUS ON FUNDAMENTAL
MECHANISMS AND PROCESSES IN HEAT AND MASS TRANSFER WITH
ONLY SECONDARY EMPHASIS ON TIE-IN WITH ANY TECHNOLOGY;
HOWEVER, THE GENERAL RESULTS OBTAINED SHOULD BENEFIT A
NUMBER OF TECHNOLOGICAL APPLICATIONS. MANY CURRENT TOPICS
OF MUTUAL INTEREST FIT THIS DESCRIPTION, AND THEY
INCLUDE:

(1) HEAT AND MASS TRANSFER IN DUCT FLOWS.

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(2) HEAT TRANSFER AROUND BODIES OF NON-ELEMENTARY SHAPES.

(3) HEAT AND MASS TRANSFER IN CAPILLARY-POROUS BODIES,
INCLUDING COMBINED CONDUCTION, CONVECTION AND RADIATION.

(4) HEAT TRANSFER IN HIGH TEMPERATURE REACTIVE SYSTEMS.

(5) HEAT TRANSFER IN TWO PHASE FLOW INCLUDING DISPERSED FLOW.

(6) RADIANT HEAT TRANSFER.

(7) THEORY OF HEAT CONDUCTION.

(8) HEAT AND MASS TRANSFER IN RHEOLOGICALLY COMPLEX SYSTEMS.

(9) PREDICTION AND MEASUREMENT OF THERMOPHYSICAL PROPERTIES OF FLUIDS.

(10) NUMERICAL METHODS IN HEAT TRANSFER.

(11) HEAT TRANSFER IN PHASE CHANGE SYSTEMS.

(12) HEAT TRANSFER IN FLUIDIZED BEDS.

BEHAVIORAL SCIENCES
(PSYCHOPHYSIOLOGY AND BEHAVIOR)

THE BROAD AND RAPIDLY ADVANCING AREA OF THE BEHAVIORAL SCIENCES, INCLUDING NEURAL MECHANISMS UNDERLYING BEHAVIOR, REPRESENTS AN OPPORTUNITY FOR U.S./U.S.S.R. COOPERATION.

OUTLINE OF PROJECTS

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1. BRAIN MECHANISMS OF LEARNING AND MEMORY.

A. NEUROPHYSIOLOGICAL MECHANISMS OF LEARNING.
B. HUMAN INFORMATION PROCESSING APPROACHES.

2. BRAIN SUBSTRATES OF MOTIVATION.

A. PSYCHOPHYSIOLOGICAL ANALYSIS.
B. ROLE OF HORMONAL, NEUROCHEMICAL, AND NEUROPHARMACOLOGICAL FACTORS (ENDORPHINS AND NEUROANATOMICAL SUBSTRATES).

3. DERIVATION OF PSYCHOPHYSICAL JUDGEMENTS (OBSERVABLE BEHAVIOR) FROM NEURAL DATA.

CONSTRUCTION OF MATHEMATICAL MODELS OF PSYCHOPHYSICAL PHENOMENA WITH NO FREE PARAMETERS. (ALL THE DEGREES OF FREEDOM ARE CAPTURED BY THE NEUROPHYSIOLOGICAL DATA.)

4. PSYCHOPHYSIOLOGICAL CORRELATES OF MORE COMPLEX OR
COGNITIVE BEHAVIOR.

- A. EVOKED BRAIN POTENTIAL RECORDED FROM THE HUMAN SCALP.
- B. CORRELATIONS BETWEEN COMPONENTS OF THE EVOKED POTENTIAL
AND ASPECTS OF COGNITIVE BEHAVIOR.
- C. PSYCHOPHYSIOLOGICAL AND COGNITIVE ANALYSES OF SOCIAL
BEHAVIOR.

LASER-INDUCED CHEMISTRY

THE USE OF LASERS MAKES NEW CHEMICAL REACTIONS POSSIBLE,
GIVES NEW METHODS OF STUDYING CHEMICAL REACTIONS, AND
PROVIDES NEW POSSIBILITIES FOR CHEMICAL SEPARATIONS.
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RESEARCH IN THIS FIELD IS FINDING MANY APPLICATIONS IN
RELATED FIELDS. DEVELOPMENTS IN ANALYTICAL CHEMISTRY,
COMBUSTION CHEMISTRY, PHOTOBIOLOGY, CHEMICAL SYNTHESIS,
CATALYSIS, AND CHEMICAL PURIFICATIONS MAY BE ANTICIPATED.
LEADING RESEARCH IS BEING DONE IN BOTH SOVIET AND
AMERICAN LABORATORIES.

IT IS RECOMMENDED THAT THE COOPERATIVE RESEARCH INCLUDE
THE FOLLOWING:

1. THE CHEMISTRY OF VIBRATIONALLY EXCITED MOLECULES,
INCLUDING:

A. MULTIPLE-PHOTON INFRARED EXCITED MOLECULES.

B. MOLECULES ON SURFACES OR COLLIDING WITH SURFACES
EXCITED BY INFRARED AND VISIBLE PHOTONS.

C. MOLECULES IN CONDENSED PHASES EXCITED BY PICOSECOND
PULSES.

2. THE CHEMISTRY OF ELECTRONICALLY EXCITED MOLECULES.

3. CHEMISTRY IN VERY INTENSE ELECTROMAGNETIC FIELDS,
INCLUDING:

A. MULTIPHOTON EXCITATION, DISSOCIATION, AND IONIZATION.

B. LASER-INDUCED COLLISIONS AND DEFORMATION OF
INTERMOLECULAR POTENTIAL SURFACES.

4. RESEARCH BASED UPON NEW DEVELOPMENTS, SINCE IMPORTANT
NEW DEVELOPMENTS ARE FREQUENT IN THIS FIELD.

PLANT SCIENCES

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COOPERATIVE PLANT SCIENCES PROJECTS ARE RECOMMENDED IN TWO PRINCIPAL AREAS: (1) PLANT POPULATION BIOLOGY AND ELECTRONIC DATA PROCESSING; AND (2) FLORISTICS, PLANT ECOLOGY, AND PHYTOGEOGRAPHY. BOTH COUNTRIES CAN GAIN FROM A SHARING OF IDEAS AND RESOURCES ON PROBLEMS SUCH AS THE ORIGIN AND EVOLUTION OF THE FLORAS OF THE ARCTIC REGION OR OF ASIA AND NORTH AMERICA. LIKEWISE, BECAUSE WORK IS CONTINUING INDEPENDENTLY AT A RAPID PACE IN BOTH COUNTRIES ON PLANT POPULATION BIOLOGY AND ELECTRONIC DATA PROCESSING, SHARING OF NEW IDEAS WOULD BE MUTUALLY BENEFICIAL.

OUTLINE OF PROJECTS

1. PLANT POPULATION BIOLOGY AND ELECTRONIC DATA PROCESSING.

A. PLANT POPULATION BIOLOGY: EXCHANGE FIELD AND COLLABORATIVE LABORATORY STUDIES ON PROBLEMS OF POPULATION DIFFERENTIATION, BREEDING SYSTEMS, POLLINATION, PLANT-ANIMAL CO-EVOLUTION ETC. RECENT STUDIES ON BREEDING SYSTEMS AND GENE FLOW ARE ESPECIALLY IMPORTANT AS SOURCES OF NEW INFORMATION FOR POTENTIAL CROP IMPROVEMENT.

B. ELECTRONIC DATA PROCESSING: EXCHANGE VISITS TO CENTERS OF BIOLOGICAL INFORMATION STORAGE AND RETRIEVAL AND COLLABORATIVE STUDIES ON NEW IDEAS SUCH AS MODELLING OF EVOLUTIONARY PROCESSES, NUMERICAL TAXONOMY, DATA BANKING, AND AUTOMATIC IDENTIFICATION.

2. FLORISTICS, PLANT ECOLOGY, AND PHYTOGEOGRAPHY.

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A. FLORISTICS: EXCHANGE FIELD STUDIES IN BOTH COUNTRIES IN AREAS OF INTEREST, WITH SPECIAL EMPHASIS ON RARE AND ENDANGERED SPECIES, AND WITH COLLECTION AND STUDY OF LIVING MATERIAL; ALSO COOPERATIVE PROJECTS ON NEW METHODS AND TECHNIQUES OF FLORISTIC RESEARCH. IN ADDITION, COOPERATIVE STUDIES MIGHT BE INITIATED ON POPULATIONS OF SPECIES OF THE CIRCUMBOREAL FLORA OF THE U.S.S.R. AND OF NORTHERN NORTH AMERICA.

B. PLANT ECOLOGY AND PHYTOGEOGRAPHY: EXCHANGE FIELD STUDIES IN BOTH COUNTRIES IN DIFFERENT ECOLOGICAL ZONES,

AND THE DEVELOPMENT OF COLLABORATIVE PROJECTS ON TOPICS

SUCH AS THE ADAPTATION OF PLANTS TO ARCTIC CONDITIONS,
OR THE ORIGIN, EVOLUTION, AND MIGRATION OF FLORAS OF
EASTERN ASIA AND EASTERN NORTH AMERICA. THESE STUDIES
ARE IMPORTANT BECAUSE MANY OF THE ECOLOGICAL LIFE ZONES
IN THE TWO COUNTRIES ARE SIMILAR (E.G., VEGETATION OF
UTAH AND ARMENIA).

THE PROJECTS WOULD BE DESIGNED SO AS NOT TO OVERLAP WITH
WORK DONE UNDER THE AGRICULTURE AGREEMENT. IF STUDIES
PROGRESSED TO THE POINT OF PLANT EXPERIMENTATION OR
EXCHANGE OF GERM PLASM, THESE COMPONENTS OF THE PROJECTS
WOULD BE TRANSFERRED TO THE JOINT COMMITTEE ON
AGRICULTURAL COOPERATION. VANCE

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